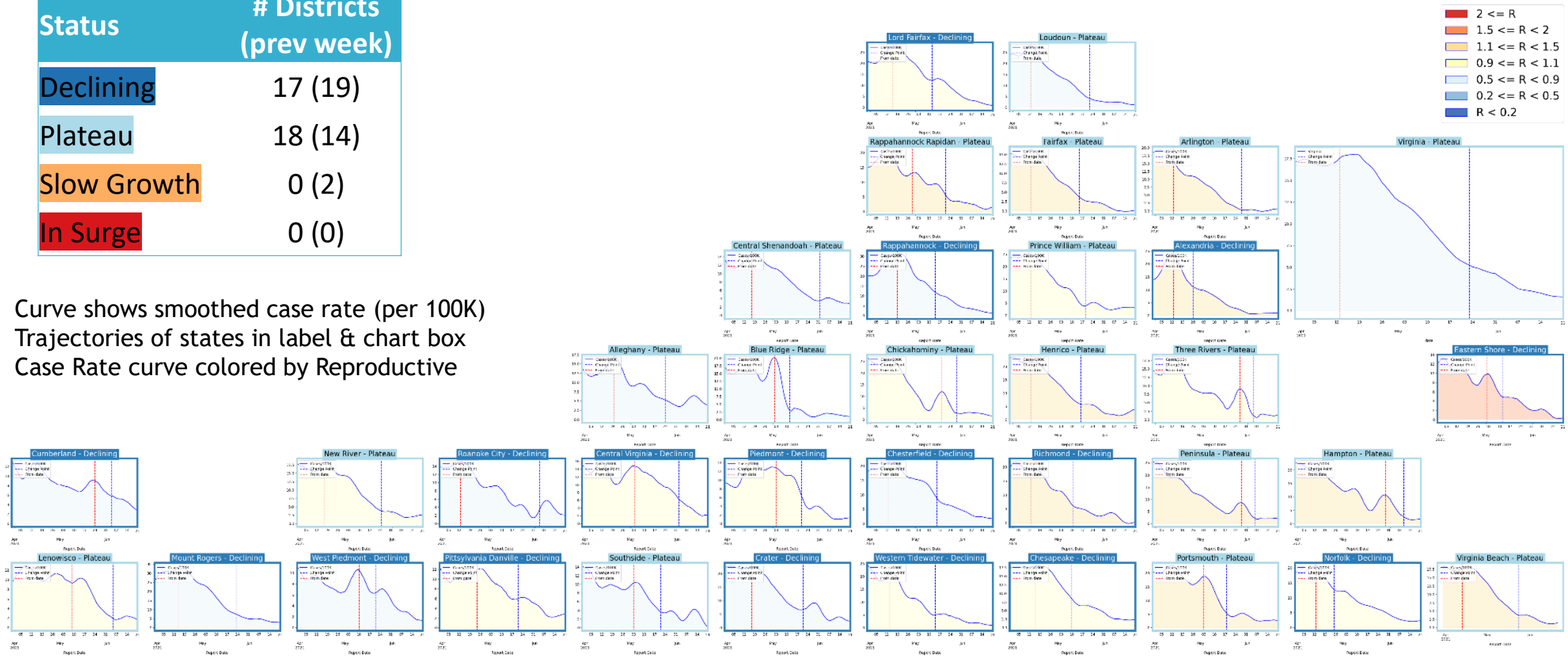
Interim Modeling Update

The UVA Biocomplexity Institute will provide full updates and projections on a bi-weekly basis. However, Virginia Department of Health staff will continue to publish key updates from the UVA team during interim weeks.

District Trajectories – Last 10 Weeks

Status	# Districts (prev week)
Declining	17 (19)
Plateau	18 (14)
Slow Growth	0 (2)
In Surge	0 (0)

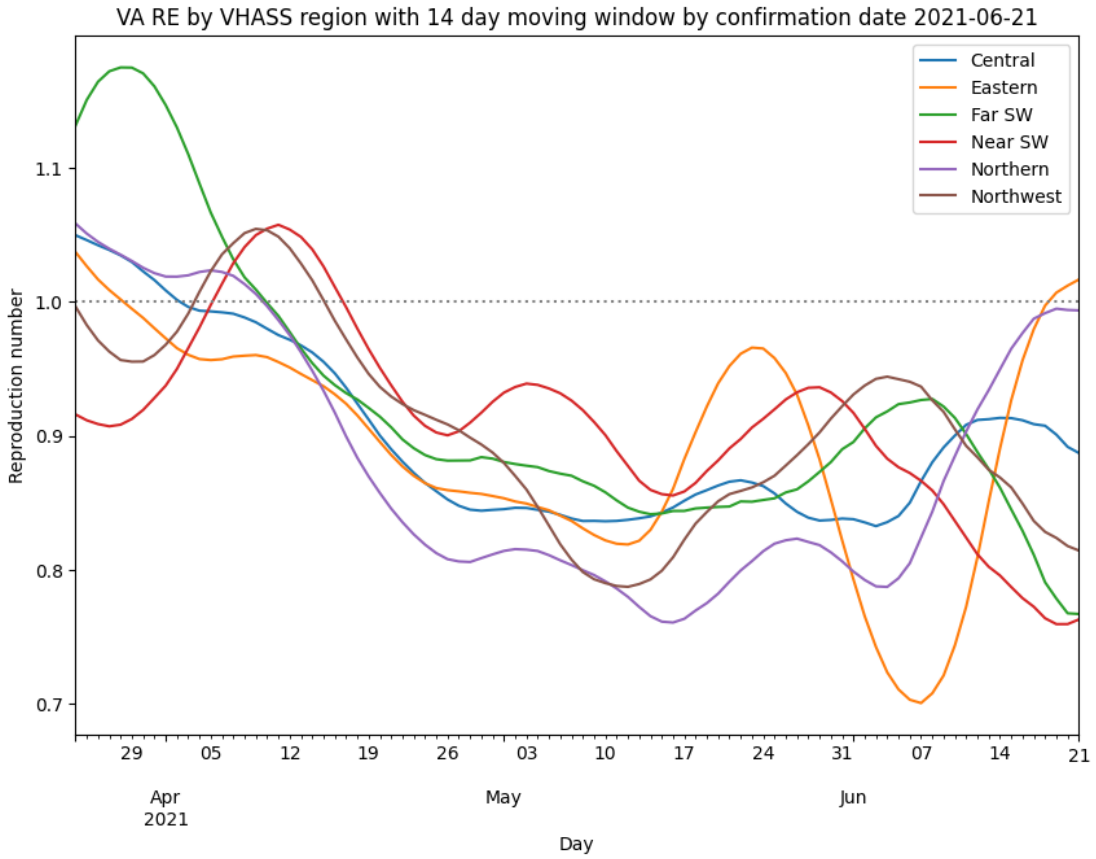
Curve shows smoothed case rate (per 100K)
Trajectories of states in label & chart box
Case Rate curve colored by Reproductive



Estimated Daily Reproduction Number

June 21th Estimates

Region	Date Confirmed R_e	Date Confirmed Diff Last Week
State-wide	0.888	-0.003
Central	0.868	-0.024
Eastern	1.024	-0.002
Far SW	0.756	0.003
Near SW	0.776	0.019
Northern	1.000	0.002
Northwest	0.805	-0.015



Methodology

- Wallinga-Teunis method (EpiEstim[1]) for cases by **confirmation date**
- Serial interval: updated to discrete distribution from observations (mean=4.3, Flaxman et al, Nature 2020)
- Using Confirmation date since due to increasingly unstable estimates from onset date due to backfill

SARS-CoV2 Delta Variant of Concern

Delta δ - Lineage B.1.617.2 and related subvariants

- Continues to drive outbreak in India and neighbors, with immeasurable numbers of cases surpassing healthcare capacities in many regions
- CDC declares it is a **Variant of Concern** following Public Health England and WHO
- Strain shows continued growth in Europe and in US
- Several studies estimate B.1.617.2 to have 100% faster growth than B.1.1.7, and a UK study suggests a 13% advantage over B.1.1.7; we are roughly tracking what seems to be a ~60% growth rate advantage in VA
- More studies show limited immune escape similar to B.1.351, however, many studies still suggest protection remains for vaccinated, especially 2 doses and mRNA vaccines
- PHE study shows limited efficacy of Astra-Zeneca with only one dose, efficacy returns following 2nd dose
- Public Health Scotland study in Lancet suggests Delta is 2x more likely to cause hospitalization than Alpha

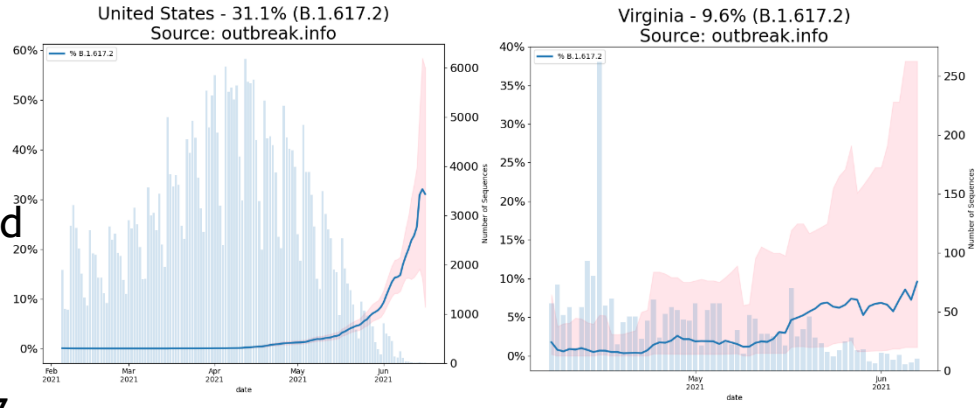
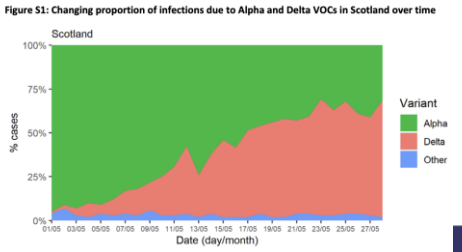


Table 1: Estimated vaccine effectiveness against hospitalisation

		Alpha			Delta		
Vaccination status		OR vs symptomatic disease	HR vs hospitalisation	VE vs hospitalisation	OR vs symptomatic disease	HR vs hospitalisation	VE vs hospitalisation
Any vaccine							
	Dose 1	0.51 (0.48-0.55)	0.44 (0.28-0.70)	78% (65-86)	0.69 (0.64-0.75)	0.37 (0.22-0.63)	75% (57-85)
	Dose 2	0.13 (0.1-0.15)	0.64 (0.24-1.72)	92% (78-97)	0.20 (0.18-0.23)	0.29 (0.11-0.72)	94% (85-98)
Pfizer							
	Dose 1	0.53 (0.47-0.58)	0.32 (0.14-0.73)	83% (62-93)	0.64 (0.54-0.77)	0.10 (0.01-0.76)	94% (46-99)
	Dose 2	0.06 (0.05-0.08)	0.88 (0.21-3.77)	95% (78-99)	0.12 (0.1-0.15)	0.34 (0.10-1.18)	96% (86-99)
Astrazeneca							
	Dose 1	0.51 (0.48-0.55)	0.48 (0.30-0.77)	76% (61-85)	0.70 (0.65-0.76)	0.41 (0.24-0.70)	71% (51-83)
	Dose 2	0.26 (0.21-0.32)	0.53 (0.15-1.80)	86% (53-96)	0.33 (0.28-0.39)	0.25 (0.08-0.78)	92% (75-97)

Public Health Englad study shows vaccines are effective against hospitalization with Delta variant infections (94-96% for Pfizer). Also shows that one dose AZ has much lower efficacy (71%) PHE



Scotland has experienced explosive growth of Delta in the month of May. Their experience found that infections with Delta variant were 2x more likely to be hospitalized than infections with Alpha variant Lancet

Other State Comparisons

Trajectories of States